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## **AMENDMENTS TO THE CLAIMS**

This listing of claims will replace all prior listings of claims in the application.

1. (currently amended) A compound of the formula (I):

$$(R^5)_2N$$
OH
OH
OH
 $K^2$ 
 $K^3$ 
 $K^3$ 

wherein,

each  $R^1$ ,  $R^2$ , and  $R^3$  are independently alkyl substituted with aryl or heteroaryl, each of which is optionally substituted with 1-5 substituents selected from  $OR^6$ , CN,  $NO_2$ ,  $NHR^7$ ,  $N(R^7)_2$ , halo,  $CONHR^7$ ,  $CON(R^7)_2$ ,  $CO_2R^8$ , or  $C_{1-6}$  alkyl;

X is N, O, or S;

R<sup>4</sup> is H, CON(R<sup>7</sup>)<sub>2</sub>, CONHR<sup>7</sup>, CH<sub>2</sub>OH, CH(OII)CH=CH<sub>2</sub>, or C(O)NHCHR<sup>10</sup>CO<sub>2</sub>II; cach R<sup>5</sup> is independently H, alkyl, alkenyl, aryl, heteroaryl, acyl, P<sup>1</sup>, or C(O)CHR<sup>10</sup>NH<sub>2</sub>;

each R<sup>6</sup> is independently H, alkyl, or P<sup>3</sup>;

each R<sup>7</sup> is independently H, alkyl, acyl, or P<sup>2</sup>;

each R<sup>8</sup> is independently H, alkyl, aralkyl, or heteroaralkyl;

each R<sup>10</sup> is independently an amino acid side chain;

each P<sup>1</sup> and P<sup>2</sup> is independently a nitrogen protecting group; and

each P<sup>3</sup> is independently an oxygen protecting group;

or pharmaceutically acceptable salts thereof.

2. (currently amended) The compound of claim 1, wherein:X is N or O;

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R<sup>1</sup> is alkyl substituted with aryl, which is optionally substituted with 1-5 substituents selected from OR<sup>6</sup>, CN, NO<sub>2</sub>, NHR<sup>7</sup>, N(R<sup>7</sup>)<sub>2</sub>, halo, CONHR<sup>7</sup>, CON(R<sup>7</sup>)<sub>2</sub>, CO<sub>2</sub>R<sup>8</sup>, or C<sub>1-6</sub> alkyl;

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R<sup>4</sup> is II, CON(R<sup>7</sup>)<sub>2</sub>, C(0)NHCHR<sup>10</sup>CO<sub>2</sub>H, or CH<sub>2</sub>OH; cach R<sup>5</sup> is independently H, alkyl, acyl, P<sup>1</sup>, or C(0)CHR<sup>10</sup>NH<sub>2</sub>; each R<sup>6</sup> is independently H, alkyl, or P<sup>3</sup>; each R<sup>7</sup> is independently H, alkyl, acyl, or P<sup>2</sup>; each R<sup>8</sup> is independently H, alkyl, aralkyl, or heteroaralkyl; each R<sup>10</sup> is independently an amino acid side chain; each P<sup>1</sup> and P<sup>2</sup> is independently a nitrogen protecting group; and each P<sup>3</sup> is independently an oxygen protecting group.

(currently amended) The compound of claim

## 1, wherein:

X is N or O;

R<sup>1</sup> is alkyl substituted with aryl, which is optionally substituted with 1-5 substituents selected from OR<sup>6</sup>, CN, NO<sub>2</sub>, halo, or C<sub>1-6</sub> alkyl;

R<sup>4</sup> is H, CONIIR<sup>7</sup>, or CH<sub>2</sub>OII; each R<sup>5</sup> is independently H or alkyl; each R<sup>6</sup> is independently H or alkyl; R<sup>7</sup> is H, alkyl, or P<sup>2</sup>; and P<sup>2</sup> is a nitrogen protecting group.

4. (currently amended) The compound of claim 1, wherein:

X is N or O;

 $R^1$  is alkyl substituted with aryl, which is optionally substituted with 1-5 substituents selected from OH or  $C_{1-6}$  alkyl; and

R<sub>4</sub> is II, CONH<sub>2</sub>, or CH<sub>2</sub>OH.

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5. (currently amended) The compound of claim 1, wherein:

X is N or O;

 $R^1$  is  $C_1$  alkyl substituted with phenyl, which is substituted at the 2- and 6- positions with Me and is substituted at the 4- position with OH; and

R4 is H, CONH2, or CH2OH.

6. (currently amended) The compound of claim 1 having the formula (II):

$$(R^{9})_{n}$$
 $(R^{9})_{n}$ 
 $(R^{9})_{n}$ 
 $(R^{9})_{n}$ 
 $(R^{9})_{n}$ 
 $(R^{9})_{n}$ 
 $(R^{9})_{n}$ 

wherein,

X is N er O;

 $R^4$  is H,  $CON(R^7)_2$ ,  $CONHR^7$ ,  $CH_2OH$ , or  $C(O)NHCHR^{10}CO_2H$ ;

each R5 is independently H, alkyl, acyl, P1, or C(O)CIIR10NH2;

each R6 is independently H, alkyl, or P3;

each R<sup>7</sup> is independently H, alkyl, acyl, or I<sup>2</sup>;

each R8 is independently II, alkyl, aralkyl, or heteroaralkyl;

each  $R^9$  is independently  $OR^6$ , CN,  $NO_2$ ,  $NHR^7$ ,  $N(R^7)_2$ , halo,  $CONHR^7$ ,  $CON(R^7)_2$ ,  $CO_2R^8$ , or  $C_{1.6}$  alkyl;

each R<sup>10</sup> is independently an amino acid side chain;

each n is independently 0, 1, 2, 3, 4, or 5;

each P1 and P2 is independently a nitrogen protecting group; and

each P3 is independently an oxygen protecting group.

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7. (original) The compound of claim 6, wherein:

R<sup>4</sup> is H, CON(R<sup>7</sup>)<sub>2</sub>, CONHR<sup>7</sup>, or CH<sub>2</sub>OH;

each R<sup>5</sup> is independently H, alkyl, or acyl;

each R<sup>6</sup> is independently H or alkyl;

each R<sup>7</sup> is independently H or alkyl;

cach R<sup>9</sup> is independently OR<sup>6</sup>, CN, NO<sub>2</sub>, halo, or C<sub>1-6</sub> alkyl; and each n is independently 0 1, 2, or 3.
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8. (original) The compound of claim 6, wherein:
 P<sup>1</sup> is a BOC or Fmoc;
 P<sup>2</sup> is a solid support; and
 P<sup>3</sup> is t-Bu, Bn, Me, or Ac.

9. (original) The compound of claim 6, wherein:

R<sup>4</sup> is H, CON(R<sup>7</sup>)<sub>2</sub>, CONHR<sup>7</sup>, or CH<sub>2</sub>OH;

each R<sup>5</sup> is independently H, alkyl, acyl, or P<sup>1</sup>;

each R<sup>6</sup> is independently H or P<sup>3</sup>;

each R<sup>7</sup> is independently H or P<sup>2</sup>;

each R<sup>9</sup> is independently OR<sup>6</sup> or C<sub>1-6</sub> alkyl;

each n is independently 0, 1, or 2;

P<sup>1</sup> is a BOC;

P<sup>2</sup> is a solid support; and

P<sup>3</sup> is t-Bu.

(original) The compound of claim 6, wherein:
 R<sup>4</sup> is II, CONH<sub>2</sub>, or CH<sub>2</sub>OII;
 cach R<sup>5</sup> is independently H, P<sup>1</sup>, or C(O)CHR<sup>10</sup>NH<sub>2</sub>;
 each R<sup>6</sup> is H or alkyl

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each R<sup>9</sup> is C<sub>1.6</sub> alkyl or OR<sup>6</sup>;
each R<sup>10</sup> is independently an amino acid side chain;
each n is independently 1, 2, or 3; and
P<sup>1</sup> is a nitrogen protecting group.

11. (currently amended) The compound of claim 1 that is formula (III):

$$(R^9)n \xrightarrow{OH} OH X \xrightarrow{OH} NH_2$$

$$(III)$$

wherein,

X is Q-or N;

R9 is C1-6 alkyl; and

n is 2.

12. (currently amended) The compound of claim 1 that is formula (IV):

wherein X is N or O.

13. (currently amended) The compound of claim 1 having the formula (V):

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$$\begin{array}{c|c} & & & \\ & & & \\ & & \\ \hline \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & \\ & & \\$$

wherein

X is N or O; and

R<sup>4</sup> is CONH<sub>2</sub>, H, or CH<sub>2</sub>OH.

14. (original) The compound of claim 1 having the formula (VI):

$$(R^5)_2N$$
OH O  $R^3$ 
OH O  $R^3$ 
(VI)

wherein,

each  $R^1$ ,  $R^2$ , and  $R^3$  is independently alkyl substituted with aryl or heteroaryl, each of which is optionally substituted with 1-5 substituents selected from  $OR^6$ , CN,  $NO_2$ ,  $NHR^7$ ,  $N(R^7)_2$ , halo,  $CONHR^7$ ,  $CON(R^7)_2$ ,  $CO_2R^8$ , or  $C_{1-6}$  alkyl;

 $R^4$  is H, CON( $R^7$ )<sub>2</sub>, CONHR<sup>7</sup>, CH<sub>2</sub>OH, or CH(OH)CH=CH<sub>2</sub>, or C(O)NIICHR<sup>10</sup>CO<sub>2</sub>H;

each  $R^5$  is independently II, alkyl, alkene, aryl, heteroaryl, acyl, or  $\tilde{P}^1$ , or  $C(O)CIIR^{10}NH_2$ ;

each R<sup>6</sup> is independently H, alkyl, or P<sup>3</sup>;

each R<sup>7</sup> is independently H, alkyl, acyl, or P<sup>2</sup>;

each R8 is independently H, alkyl, aralkyl, or heteroaralkyl;

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each  $R^{10}$  is independently an amino acid side chain; each  $P^1$  and  $P^2$  is independently a nitrogen protecting group; and each  $P^3$  is independently an oxygen protecting group.

15. (original) The compound of claim 14, wherein:

each  $R^1$ ,  $R^2$ , and  $R^3$  is independently alkyl substituted with aryl, each of which is optionally substituted with 1-5 substituents selected from  $OR^6$ , CN,  $NO_2$ , halo, or  $C_{1.6}$  alkyl;

R<sup>4</sup> is H<sub>1</sub> CON(R<sup>7</sup>)<sub>2</sub>, or CONHR<sup>7</sup>, or C(O)NHCHR<sup>10</sup>CO<sub>2</sub>H; cach R<sup>5</sup> is independently H, alkyl, acyl, P<sup>1</sup>, or C(O)CHR<sup>10</sup>NH<sub>2</sub>; and each R<sup>10</sup> is independently an amino acid side chain.

16. (original) A method of making a compound of the formula (VIII):

comprising coupling compounds of the formulas (XI) and (XII)

$$P^{1} \underset{H}{\overset{R^{11}}{\bigvee}} \underset{OH}{\overset{Q}{\bigvee}} \underset{O}{\overset{R^{12}}{\bigvee}} \underset{H}{\overset{Q}{\bigvee}} \underset{N}{\overset{P^{2}}{\bigvee}} \underset{H}{\overset{Q}{\bigvee}} \underset{N}{\overset{P^{2}}{\bigvee}}$$
(XI)

using a ruthenium catalyst, to give a compound of formula (IX); and

reacting the compound of formula (IX) with a deprotecting agent to give a compound of the formula (VIII);

wherein,

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each  $R^1$ ,  $R^2$ , and  $R^3$  is independently alkyl substituted with aryl or heteroaryl, each of which is optionally substituted with 1-5 substituents selected from  $OR^6$ , CN,  $NO_2$ ,  $NHR^7$ ,  $N(R^7)_2$ , halo,  $CONHR^7$ ,  $CON(R^7)_2$ ,  $CO_2R^8$ , or  $C_{1-6}$  alkyl;

each R6 is independently H, alkyl, or P3;

each R<sup>7</sup> is independently H, alkyl, acyl, or P<sup>4</sup>;

each R8 is independently H, alkyl, aralkyl, or heteroaralkyl;

each  $R^{11}$ ,  $R^{12}$ , and  $R^{13}$  is independently alkyl substituted with aryl or heteroaryl, each of which is optionally substituted with 1-5 substituents selected from  $OR^{16}$ , CN,  $NO_2$ ,  $NHR^{17}$ ,  $N(R^{17})_2$ , halo,  $CONHR^{17}$ ,  $CON(R^{17})_2$ ,  $CO_2R^{18}$ , or  $C_{1-6}$  alkyl;

each R16 is independently H, alkyl, or P3;

each R<sup>17</sup> is independently II, alkyl, acyl, or P<sup>4</sup>;

each R18 is independently H, alkyl, aralkyl, or heteroaralkyl;

each P<sup>1</sup>, P<sup>2</sup>, and P<sup>4</sup> is independently a nitrogen protecting group; and each P<sup>3</sup> is independently an oxygen protecting group.

17. (original) A method of making a compound of the formula (XVI):

comprising coupling compounds of the formulas (XI) and (XIII)

by first reacting the free alcohols with a silicon protecting group, and then treating the resulting compound with a ruthenium catalyst, giving a compound of the formula (VII);

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reacting the compound of formula (VII) under pH conditions sufficient to remove acid labile protecting groups, if any;

treating the resulting product with peroxide and base under conditions sufficient to hydrolyze the thioester; and

coupling the resulting product with a solid phase peptide, giving a compound of the formula (XVI);

wherein,

each  $R^1$ ,  $R^2$ , and  $R^3$  is independently alkyl substituted with aryl or heteroaryl, each of which is optionally substituted with 1-5 substituents selected from  $OR^6$ , CN,  $NO_2$ ,  $NHR^7$ ,  $N(R^7)_2$ , halo,  $CONHR^7$ ,  $CON(R^7)_2$ ,  $CO_2R^8$ , or  $C_{1-6}$  alkyl;

each R6 is independently H, alkyl, or P3;

each R7 is independently H, alkyl, acyl, or P4;

each R8 is independently H, alkyl, aralkyl, or heteroaralkyl;

each  $R^{11}$  and  $R^{12}$  is independently alkyl substituted with aryl or heteroaryl, each of which is optionally substituted with 1-5 substituents selected from  $OR^{16}$ , CN,  $NO_2$ ,  $NHR^{17}$ ,  $N(R^{17})_2$ , halo,  $CONHR^{17}$ ,  $CON(R^{17})_2$   $CO_2R^{18}$ , or  $C_{1.6}$  alkyl;

each R<sup>16</sup> is independently H, alkyl, or P<sup>3</sup>;

each R<sup>17</sup> is independently H, alkyl, acyl, or P<sup>4</sup>;

each R<sup>18</sup> is independently II, alkyl, aralkyl, or heteroaralkyl;

each P1 and P4 is independently a nitrogen protecting group; and

each P3 is independently an oxygen protecting group; and

P<sup>5</sup> is a sulfur protecting group.

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## 18. (currently amended) A method of making a compound of the formula (X1V):

$$R^1$$
 $R^2$ 
 $R^4$ 
 $R^2$ 
 $R^4$ 
 $R^3$ 
 $R^4$ 
 $R^4$ 
 $R^4$ 
 $R^4$ 

comprising coupling compounds of formulas (XI) and (XIII),

with a ruthenium catalyst;

treating the resulting compound with peroxide and base under conditions sufficient to hydrolyze the thioester;

amidation or esterification of the resulting acid; and

treatment of the resulting compound with a deprotecting agent sufficient to remove protecting groups, giving a compound of the formula (XIV);

wherein,

each  $R^1$ ,  $R^2$ , and  $R^3$  is independently alkyl substituted with aryl or heteroaryl, each of which is optionally substituted with 1-5 substituents selected from  $OR^6$ , CN,  $NO_2$ ,  $NIIR^7$ ,  $N(R^7)_2$ , halo,  $CONHR^7$ ,  $CON(R^7)_2$ ,  $CO_2R^8$ , or  $C_{1.6}$  alkyl;

X is N or O;

R<sup>4</sup> is H, CON(R<sup>7</sup>)<sub>2</sub>, CONHR<sup>7</sup>, CH<sub>2</sub>OII, or CH(OII)CH=CH<sub>2</sub>;

each R6 is independently H, alkyl, or P3;

each R<sup>7</sup> is independently II, alkyl, acyl, or P<sup>4</sup>;

each R8 is independently H, alkyl, aralkyl, or heteroaralkyl;

each R11 and R12 are independently alkyl substituted with aryl or heteroaryl, each of

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which is optionally substituted with 1-5 substituents selected from OR<sup>16</sup>, CN, NO<sub>2</sub>, NHR<sup>17</sup>, N(R<sup>17</sup>)<sub>2</sub>, halo, CONIR<sup>17</sup>, CON(R<sup>17</sup>)<sub>2</sub>, CO<sub>2</sub>R<sup>18</sup>, or C<sub>1.6</sub> alkyl; cach R<sup>16</sup> is independently H, alkyl, or P<sup>3</sup>; cach R<sup>17</sup> is independently II, alkyl, acyl, or P<sup>4</sup>; cach R<sup>18</sup> is independently II, alkyl, aralkyl, or heteroaralkyl; each P<sup>1</sup> and P<sup>4</sup> is independently a nitrogen protecting group; each P<sup>3</sup> is independently an oxygen protecting group; and P<sup>5</sup> is a sulfur protecting group.

19. (original) A method of making a compound of formula (XVII):

$$R^3$$
 $R^2$ 
 $OH$ 
 $OH$ 
 $OH$ 
 $OH$ 
 $OH$ 
 $OH$ 

comprising coupling compounds of formulas (XI) and (XIII)

with a ruthenium catalyst;

treating the resulting compound with peroxide and base under conditions sufficient to hydrolyze the thioester; and

reacting the free hydroxyls with an oxygen protecting group to give a compound of formula (XVIII)

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coupling the compound of formula (XVIII) with an alcohol of formula  $R^{13}(CHOH)CHOR^{16}$ ; and

treating the resulting compound with a deprotecting agent sufficient to remove protecting groups to give a compound of formula (XVII);

wherein,

each  $R^1$ ,  $R^2$ , and  $R^3$  is independently alkyl substituted with aryl or heteroaryl, each of which is optionally substituted with 1-5 substituents selected from  $OR^6$ , CN,  $NO_2$ ,  $NIIR^7$ ,  $N(R^7)_2$ , halo,  $CONHR^7$ ,  $CON(R^7)_2$ ,  $CO_2R^8$ , or  $C_{1-6}$  alkyl;

each R<sup>6</sup> is independently II, alkyl, or P<sup>3</sup>;

each R<sup>7</sup> is independently H, alkyl, acyl, or P<sup>4</sup>;

each R8 is independently H, alkyl, aralkyl, or heteroaralkyl;

cach  $R^{11}$ ,  $R^{12}$ , and  $R^{13}$  is independently alkyl substituted with aryl or heteroaryl, each of which is optionally substituted with 1-5 substituents selected from  $OR^{16}$ , CN,  $NO_2$ ,  $NIIR^{17}$ ,  $N(R^{17})_2$  halo,  $CONIIR^{17}$ ,  $CON(R^{17})_2$   $CO_2R^{18}$ , or  $C_{1-6}$  alkyl;

each R<sup>16</sup> is independently H, alkyl, or P<sup>3</sup>;

each R<sup>17</sup> is independently H, alkyl, acyl, or P<sup>4</sup>;

each R18 is independently H, alkyl, aralkyl, or heteroaralkyl;

each P1 and P4 is independently a nitrogen protecting group;

each P3 is independently an oxygen protecting group; and

 $P^5$  is a sulfur protecting group.

- 20. (original) A composition comprising a compound of formula (I) in claim 1 and a pharmaceutically acceptable carrier.
- 21. (currently amended) A compound of formula (XIX):

$$(R^5)_2N$$
 $OH$ 
 $OH$ 
 $OH$ 
 $R^2$ 
 $X$ 
 $R^4$ 
 $OH$ 
 $O$ 

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wherein,

each R<sup>1</sup>, R<sup>2</sup>, and R<sup>3</sup> is independently alkyl substituted with anyl or heteroaryl, each of which is optionally substituted with 1-5 substituents selected from OR<sup>6</sup>, CN, NO<sub>2</sub>, NIIR<sup>7</sup>, N(R<sup>7</sup>)<sub>2</sub> halo, CONHR<sup>7</sup>, CON(R<sup>7</sup>)<sub>2</sub>, CO<sub>2</sub>R<sup>8</sup>, or C<sub>1-6</sub> alkyl;

X is N, O, or S;

R<sup>4</sup> is H, CON(R<sup>7</sup>)<sub>2</sub>, CONHR<sup>7</sup>, CH<sub>2</sub>OH, CH(OH)CH=CH<sub>2</sub>, or C(O)NHCHR<sup>10</sup>CO<sub>2</sub>H; cach R<sup>5</sup> is independently II, alkyl, alkenyl, aryl, heteroaryl, acyl, P<sup>1</sup>, or C(O)CHR<sup>10</sup>NH<sub>2</sub>; each R<sup>6</sup> is independently II, alkyl, or P<sup>3</sup>; each R<sup>7</sup> is independently H, alkyl, acyl, or P<sup>2</sup>; each R<sup>8</sup> is independently II, alkyl, aralkyl, or heteroaralkyl; each R<sup>10</sup> is independently an amino acid side chain; cach P<sup>1</sup> and P<sup>2</sup> is independently a nitrogen protecting group; each P<sup>3</sup> is independently an oxygen protecting group; and or pharmaccutically acceptable salts thereof.

22. (currently amended) The compound of claim 21 wherein:

X is N or-O;

R<sup>1</sup> is alkyl substituted with aryl, which is optionally substituted with 1-5 substituents selected from OR<sup>6</sup>, CN, NO<sub>2</sub>, NIIR<sup>7</sup>, N(R<sup>7</sup>)<sub>2</sub>, halo, CONIIR<sup>7</sup>, CON(R<sup>7</sup>)<sub>2</sub>, CO<sub>2</sub>R<sup>8</sup>, or C<sub>1.6</sub> alkyl;

R<sup>4</sup> is II, CON(R<sup>7</sup>)<sub>2</sub>, C(O)NHCHR<sup>10</sup>CO<sub>2</sub>H, or CH<sub>2</sub>OH; and each R<sup>5</sup> is independently II, alkyl, acyl, P<sup>1</sup>, or C(O)CHR<sup>10</sup>NH<sub>2</sub>; each R<sup>10</sup> is independently an amino acid side chain.

- 23. (currently amended) The compound of claim
- 21, wherein:

X is N er-O;

R<sup>1</sup> is alkyl substituted with aryl, which is optionally substituted with 1-5 substituents selected from OR<sup>6</sup>, CN, NO<sub>2</sub>, halo, or C<sub>1-6</sub> alkyl;

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R<sup>4</sup> is H, CONHR<sup>7</sup>, or CH<sub>2</sub>OH;

each R<sup>5</sup> is independently H or alkyl;

each R6 is independently H or alkyl; and

 $R^7$  is H, alkyl, or  $P^2$ .

24. (currently amended) The compound of claim 21, wherein:

X is N or O;

 $R^1$  is alkyl substituted with aryl, which is optionally substituted with 1-5 substituents selected from OII or  $C_{1\cdot6}$  alkyl; and

R4 is II, CONH2, or CH2OH.

25. (currently amended) The compound of claim 21, wherein:

X is Nor-O;

R<sup>1</sup> is C<sub>1</sub> alkyl substituted with phenyl, which is substituted at the 2- and 6- positions with Me and is substituted at the 4- position with OH; and

R4 is H, CONII2, or CH2OIL

26. (original) The compound of claim 21, wherein

X is N;

 $R^{1}$  is methyl substituted with phenyl, which is substituted at the 4- position with OII; and  $R^{4}$  is CONH<sub>2</sub>.

27. (currently amended) The compound of claim 21 having the formula (XX):

$$(XX)$$

wherein,

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X is N or O;

R<sup>4</sup> is II, CON(R<sup>7</sup>)<sub>2</sub>, CONHR<sup>7</sup>, CH<sub>2</sub>OH, or C(O)NHCHR<sup>10</sup>CO<sub>2</sub>II;

each R<sup>5</sup> is independently H, alkyl, acyl, P<sup>1</sup>, or C(O)CHR<sup>10</sup>NH<sub>2</sub>;

cach R<sup>6</sup> is independently II, alkyl, or P<sup>3</sup>;

each R<sup>7</sup> is independently H, alkyl, acyl; or P<sup>2</sup>;

each R<sup>8</sup> is independently H, alkyl, aralkyl, or heteroaralkyl;

cach R<sup>9</sup> is independently OR<sup>6</sup>, CN, NO<sub>2</sub>, NHR<sup>7</sup>, N(R<sup>7</sup>)<sub>2</sub>, halo, CONHR<sup>7</sup>, CON(R<sup>7</sup>)<sub>2</sub>,

CO<sub>2</sub>R<sup>8</sup>, or C<sub>1.6</sub> alkyl;

each R<sup>10</sup> is independently an amino acid side chain;

cach n is independently 0, 1, 2, 3, 4, or 5;

each P<sup>1</sup> and I<sup>2</sup> is independently a nitrogen protecting group; and

each P<sup>3</sup> is independently an oxygen protecting group.
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R<sup>4</sup> is H, CON(R<sup>7</sup>)<sub>2</sub>, CONHR<sup>7</sup>, or CH<sub>2</sub>OII;
each R<sup>5</sup> is independently H, alkyl, or acyl;
each R<sup>6</sup> is independently H or alkyl;
each R<sup>7</sup> is independently H or alkyl;
each R<sup>9</sup> is independently OR<sup>6</sup>, CN, NO<sub>2</sub>, halo, or C<sub>1-6</sub> alkyl; and
each n is independently O 1, 2, or 3.
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29. (original) The compound of claim 27, wherein:

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R<sup>4</sup> is II, CON(R<sup>7</sup>)<sub>2</sub>, CONHR<sup>7</sup>, or CH<sub>2</sub>OII;
each R<sup>5</sup> is independently II, alkyl, acyl, or P<sup>1</sup>;
each R<sup>6</sup> is independently H or P<sup>3</sup>;
each R<sup>7</sup> is independently H or P<sup>2</sup>;
each R<sup>9</sup> is independently OR<sup>6</sup> or C<sub>1-6</sub> alkyl;
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each n is independently 0 or 1;

P1 is a BOC:

P2 is a solid support; and

 $P^3$  is t-Bu.

30. (original) The compound of claim 27, wherein:

R4 is H, CONH2, or CH2OH;

each  $R^5$  is independently H,  $P^1$ , or C(O)CHR $^{10}$ NH<sub>2</sub>;

each R6 is H or alkyl

each R9 is C1-6 alkyl or OR6;

each R<sup>10</sup> is independently an amino acid side chain;

each n is independently 1, 2, or 3; and

P is a nitrogen protecting group.

31. (currently amended) The compound of claim 21 having the formula (XXI):

HO 
$$(XXI)$$
 OH  $(XXI)$ 

wherein,

X is O or N;

R<sup>4</sup> is II, CONH<sub>2</sub>, or CH<sub>2</sub>OII;

R9 is C1-6 alkyl; and

n is 2.

32. (original) The compound of claim 21 having the formula (XXII):

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wherein

R2 is C1-6 alkyl; and

n is 0, 1, or 2.

33. (original) A method of making a compound of formula (XXIII):

comprising coupling compounds of formulas (XXV) and (XIII)

using a ruthenium catalyst, giving a compound of the formula (XXIV);

treating the resulting product with peroxide and base under conditions sufficient to hydrolyze the thioester;

coupling the resulting product with a solid phase peptide; and

treating the resulting compound with a deprotecting agent, giving a compound of the formula (XXIII);

wherein,

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cach R<sup>1</sup>, R<sup>2</sup>, and R<sup>3</sup> is independently alkyl substituted with aryl or heteroaryl, each of which is optionally substituted with 1-5 substituents selected from OR<sup>6</sup>, CN, NO<sub>2</sub>, NHR<sup>7</sup>, N(R<sup>7</sup>)<sub>2</sub>, halo, CONHR<sup>7</sup>, CON(R<sup>7</sup>)<sub>2</sub>, CO<sub>2</sub>R<sup>8</sup>, or C<sub>1-6</sub> alkyl;

each R<sup>6</sup> is independently II, alkyl, or P<sup>3</sup>;
each R<sup>7</sup> is independently II, alkyl, acyl, or P<sup>4</sup>;
each R<sup>8</sup> is independently H, alkyl, aralkyl, or heteroaralkyl;

each R<sup>11</sup> and R<sup>12</sup> is independently alkyl substituted with aryl or heteroaryl, each of which is optionally substituted with 1-5 substituents selected from OR<sup>16</sup>, CN, NO<sub>2</sub>, NHR<sup>17</sup>, N(R<sup>17</sup>)<sub>2</sub>, halo, CONHR<sup>17</sup>, CON(R<sup>17</sup>)<sub>2</sub>, CO<sub>2</sub>R<sup>18</sup>, or C<sub>1-6</sub> alkyl;

each R<sup>16</sup> is independently H, alkyl, or P<sup>3</sup>;
each R<sup>17</sup> is independently H, alkyl, acyl, or P<sup>4</sup>;
each R<sup>18</sup> is independently II, alkyl, aralkyl, or heteroaralkyl;
each P<sup>1</sup> and P<sup>4</sup> is independently a nitrogen protecting group;
each P<sup>3</sup> is independently an oxygen protecting group; and
P<sup>5</sup> is a sulfur protecting group.

- 34. (original) A composition comprising a compound of formula (XIX) in claim 21 or pharmaceutically acceptable salts thereof and a pharmaceutically acceptable carrier.
- 35. (currently amended) A method of treating a mu opioid receptor (MOR) mediated disorder that is pain in a subject comprising administering a compound of formula (I) in claim 1 or a compound of formula (XIX) in claim 21 or pharmaceutically acceptable salts thereof.
- 36. (currently amended) A method of treating a mu opioid receptor (MOR) mediated disorder that is pain in a subject comprising administering a composition comprising a compound of formula (I) in claim 1 or a compound of formula (XIX) in claim 21 or pharmaceutically acceptable salts thereof.
- 37. (original) A method of treating pain in a subject, comprising administering to the subject a compound of formula (I) in claim I or of formula (XIX) in claim 21 or pharmaceutically acceptable salts thereof.

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38. (cancelled)